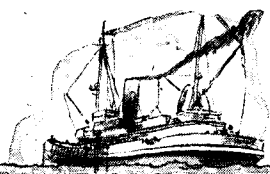


Safe—with Davy Jones



SIX doomed men in the S-4 were tapping for help in Provincetown Harbor. A few days later four of the navy's best submarine experts were pounding a table in Washington. At that table sat Walter Davenport, sent by Collier's to find out why our submarines must be floating coffins.

SINCE 1915 the American submarine has been the victim of five major disasters, to say nothing of minor ones involving loss of life, none of which was caused by an act of war:

1. March, 1915, the F-4 sank in 300 feet of water near Honolulu. The cause was never disclosed. Rescue vessels working in calm waters brought her to the surface once, but their loop slipped, cables proved to be too weak, and she was abandoned. The entire crew perished.

2. September, 1920, the S-5 submerged, with one of her air intake valves open, off the Delaware Capes. She foundered in 105 feet of water. Her crew were able to pump enough water out of her to make her stand on her nose, which put her stern above the surface. The steamship General Goethals then rescued the crew after thirty-seven hours of horror.

3. In October, 1923, the O-5 was smashed by the steamer Abangarez in Limon Bay, Panama. Only a few of the crew were aboard the submarine but three of them died in the submerged ship.

4. September, 1925, the S-51 sank after a surface collision with the steamship City of Rome. Thirty-four of her crew perished.

5. The S-4. . . .

AFTER much talk, predicated upon the S-4 horror, but about submarines in general and safety devices in particular, the naval constructor who until now had been least voluble slapped the table and hunched his shoulders impatiently.

"I've got to go," he said coldly. "It all comes down to this: the country can have its choice. Either it can have submarines designed, equipped and prepared for war emergency or it can have submarines so encumbered with safety appliances that they will be little more than diving ships. It's a choice among torpedoes and maneuverability and dead-ends; it's a question which is to get the protection: the civilian population which pays taxes to have our shores policed or the relatively few men who man the submersibles."

"But can't the American submarine match the foreign submarine in fighting power and still have all the safety devices and accessories that the Germans, the British and the Italians have?" I asked.

"What, for example?"

"Grappling rings, telephone signal buoys, food and air tubes to each compartment, salvage ships equipped with derricks."

"Who says the Germans, the British and the Italians have these things?" he demanded.

"Various congressmen, engineers and—"

Convicting the Dead

HE AROSE from the table in a huge room in the Navy Department, saying that he was late for an appointment. As he was putting on his overcoat he said:

"Congressmen, engineers, the newspapers! My friend, the United States Navy ignores all information as to what other navies are doing unless it comes through official channels."

Then, exhibiting the true sailor's flair for the dramatic, he placed a finger gently upon a photograph of a man who had been one of his closest friends—Lieutenant Commander Roy Keller Jones of the S-4—and left the conference, saying:

"I suppose they'd have my blood if I were to make that statement publicly now, but Jones thought that way too.

Jones said just that after the S-51, although all the safety devices in God's creation wouldn't have saved a man of the S-51 crew."

He departed smiling, though it was a hard smile in which his eyes did not participate, and that left four of us—a navy designer whose fame is international; an S-boat commander called from his submarine to help the Navy Department heads in their hour of distress; a marine engineer whose specialty is the new V-boats which will dwarf the S-boats; and myself, the only civilian present.

And all of these navy men nodded slow, positive corroboration of every word the constructor had uttered. From them in three hours of questions and answers, many of which were repetition and painstaking simplification of technicalities, I had got this:

That against its will and judgment, but forced by the hot hand of public opinion, the navy is going to equip a few of our submarines with devices which would have given the men of the S-4 at least a fighting chance for life.

That no matter where responsibility for the ramming of the S-4 by the flying rum chaser Paulding is laid, the Navy Department will cling to the conviction that Commander Jones, or whoever was at the periscope, was to blame.

That nothing short of legislation or navy regulation born of threatened legislation will bring the powerful senior officers of the American navy to adopt any safety apparatus which would compel the sacrifice of a single ton of fighting weight.

That all the recommendations and decisions of boards of inquiry, boards of experts and congressional committees will not alter the navy's own conviction that if our submarines cannot fare forth among surface shipping unchaperoned without coming to grief, then there is something wrong with our submarine commanders.

That the navy will never admit that there is anything wrong with our submarines, our submarine commanders or

the current system, because the department will point with pride to their own records, which show that since the war our submarines have successfully cruised 1,000,000 hours, 80,000 submerged. If the public does not wish to accept this as conclusive proof that the navy is capable of handling all submarine situations without interference—well, the public is ignorantly unreasonable. Only one of the submarine experts whom I talked to in the Navy Department dissented from this viewpoint, and he said:

"The navy doesn't understand the public, and the public doesn't understand the navy, and it looks as though neither cared. The navy will be the loser."

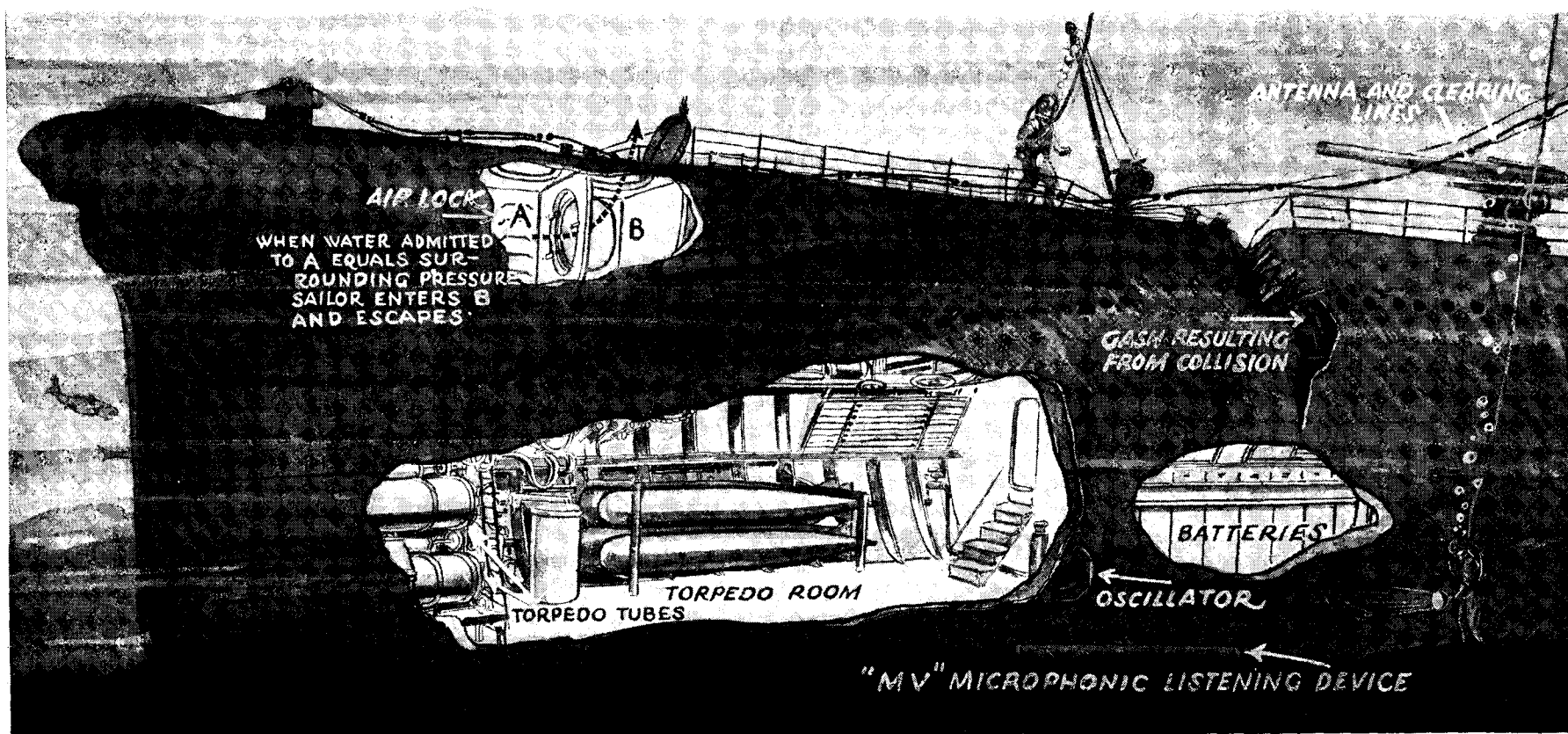
A Safety Device—Perhaps

HOWEVER, the discussion of the S-4 was incidental; the principal talk was of safety appliances, devices, appurtenances and accessories. I shall set them down here as the navy men discussed them.

The S-4, like other submarines of her class, was equipped with an escape chamber in the conning tower. The Paulding's keel ripped the half-inch shell of the submarine so wide that access to the conning tower was impossible to Lieutenant Graham Newell Fitch and his five men; so that was of no value.

The S-4 was equipped with air-salvage lines through which air could have been supplied from above had not the Paulding wrecked the system. This air-salvage system depended solely upon one flange or intake from which the pipes to the various compartments were to be supplied. But in smashing a part of the single-intake system the Paulding wrecked the entire system—a possibility which the navy claims not to have appreciated.

Therefore such safety provisions must be cast aside as useless in any accident which extends to the single-intake system and prevents access to the conning tower—and virtually all of our sub-



By WALTER DAVENPORT

marine accidents have done just that.

Instead of these inadequate agencies of succoring the crew of a crippled submerged submarine the navy now offers air locks for each compartment of the ship and air-salvage junctions or flanges on each separate compartment. Had the S-4 been so equipped, food and air could have been passed at once to the six men in the after compartment even if they had not wanted to brave the dangers of the air lock.

The air lock may be called a cousin of the conning-tower escape chamber, although it is more scientific in principle. It looks rather like a barrel with a dome instead of a flat head. It stands flat upon the deck and it is absolutely water-tight.

The submarine is resting on the bottom of the bay, for example. The first sailor to enter the air lock does so through a water-tight door in its base. Once inside he closes that door and stands on it. He then opens a valve in the side of the air lock, letting in the sea water. At his right hand, in the wall of the air lock, is a door covering a manhole large enough to permit him to escape.

The sea water rises in the domed

To left: forward air lock. Below: conning-tower exit. Right: aft air lock in detail

air lock until it has reached the occupant's shoulders, and there, owing to the pressure of the air in the dome, the water stops. Your sailor then opens the manhole, which automatically closes after he has passed through, and ducks out into the open sea. All this, of course, on the hypothesis that the injured ship is resting on an even keel or approximately so.

Now, all this sounds simple, but the navy officials go on to explain grimly that the chances are great that your sailor will drown before reaching the surface. Only that sailor whose physical endurance is well above the average and whose mental equipment is such as to insure him against panic has much chance if, say, he emerges from the air lock at a point 150 feet below the surface.

They arrive at this unlovely fact in this manner: the man will not leave the air lock in the best of condition because of the tremendous pressure his head was subjected to inside the air lock. He will plunge into the sea under heavy pressure. He will not have filled

his lungs to their capacity because of the pressure and the consequent difficulty in breathing.

He will not rise at a rate of much more than two feet a second. Only the extraordinary man will, under such conditions, be able to hold his breath more than a minute and a half. You may figure it out yourself. Indeed, the experts of the Navy Department have so little faith in air locks that they say that only one or two of the men of the S-4 would have had much chance to reach the surface alive even though the S-4 lay only 120 feet below the surface.

"Nevertheless," said the submarine commander, "drowning is better than slow suffocation—if the air-supply lines go wrong."

After the sailor has left the air lock the water therein is drained out into the ship's hull and another man enters to take his chance.

"Couldn't each man entering the air lock wear a helmet which would protect him against the pressure and also provide him with oxygen for his perilous upward trip?" I asked.

"Yes," was the reply, "if we had such a helmet."

"Why, then," I asked, "do you select the air lock as a safety device when you have so little faith in it?"

The answer was strictly military. This air lock can be utilized for military or war purposes—purposes which will supplement the submarine's fighting qualities—as well as a means of possible escape in time of calamity. In other words, the naval constructors refuse to encumber the submarine with "safety" equipment which has no other use to the ship and the weight of which would mean the sacrifice of fighting tonnage.

"What about grappling rings or hooks on the submarine, then?" I asked. "The German U-3 foundered in the Kiel Canal in 1911, and her nose was dragged to the surface by means of chains slipped through her rings. Twenty-seven of her crew were saved in that way."

Again the answer was prompt, mathematical, military. The U-3 was a 450-ton ship; the S-boats of the American navy are 850-ton craft, and the new V-boats vary from 1,700 tons to 3,000 tons. And the United States Navy Department has no "official information" that Germany or any other country has the equipment to raise with the agency of grappling rings a submersible of greater tonnage than the U-3.

But that isn't the chief objection to grappling rings. Slowly and with great emphasis the navy men told me that only over their prostrate forms would the department accede to rings, because of their weight.

Rings too Heavy—Also Useless

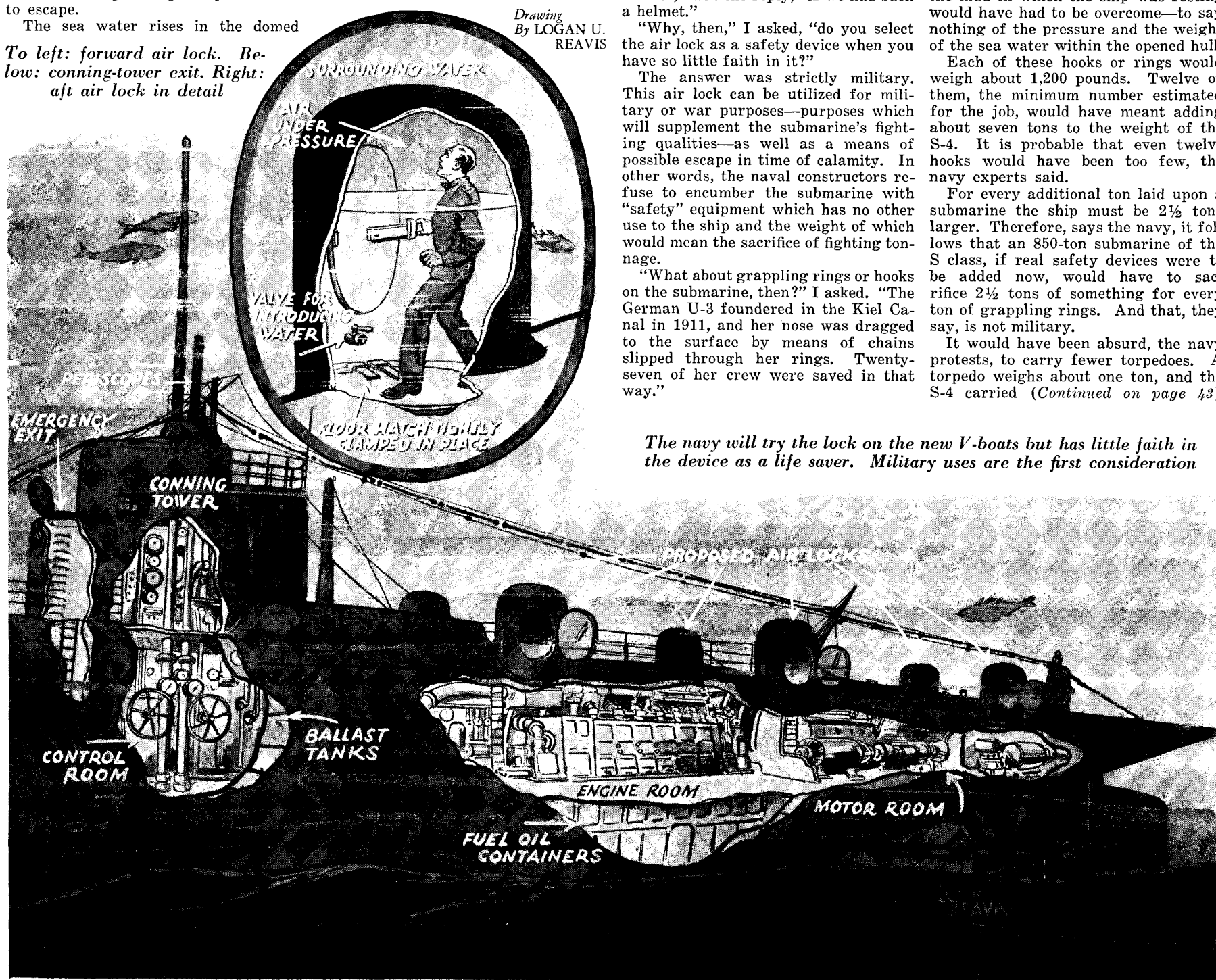
IT IS estimated that to hoist a submarine the size of the S-4 out of the silt of Cape Cod Bay it would have been necessary to have at least six—perhaps eight—rings or hooks on each side of the ship. Not only the dead weight of the ship would have had to be taken into account but the retaining suction of the mud in which the ship was resting would have had to be overcome—to say nothing of the pressure and the weight of the sea water within the opened hull.

Each of these hooks or rings would weigh about 1,200 pounds. Twelve of them, the minimum number estimated for the job, would have meant adding about seven tons to the weight of the S-4. It is probable that even twelve hooks would have been too few, the navy experts said.

For every additional ton laid upon a submarine the ship must be 2½ tons larger. Therefore, says the navy, it follows that an 850-ton submarine of the S class, if real safety devices were to be added now, would have to sacrifice 2½ tons of something for every ton of grappling rings. And that, they say, is not military.

It would have been absurd, the navy protests, to carry fewer torpedoes. A torpedo weighs about one ton, and the S-4 carried (Continued on page 43)

Drawing
By LOGAN U.
REAVIS



The navy will try the lock on the new V-boats but has little faith in the device as a life saver. Military uses are the first consideration

A Man Must Eat

By EDGAR WALLACE

BETWEEN the Kentish coast and the town of Ashford is a large, square green field bordered about with a white fence, and in the center of the field, picked out in stones which are limewashed every month, are the words:

CON-LACTO
IS STRENGTH

Giles Broad had often zoomed Z. H. L. M-Q into the clouds that he might avoid that offensive sight. However, on clear days Con-Lacto was plainly visible for fifteen miles at 10,000 feet, and Giles had got into the habit of flying low so that he might pass this evidence of Mr. Conway's shame and complacency so rapidly that the words could not be read.

At least he did until one day when he dropped so near that he narrowly escaped touching the spire of Linthorpe Church.

Not that his passengers knew anything about their danger. They were usually so busy being sick, or praying for Croydon, that death seemed a pleasant alternative route to comfort and stability.

Four days a week Giles piloted the London-Brussels air packet of the Cloudway Route. It was a dull life compared with those thrilling days of war, when you might not cross the Belgian coast line without inviting permanent disablement.

Sometimes he would make a wide detour, and cross the old battlefields, barging into the salient in his endeavor to pick out such of the places as had immediate interest for him: the old farm where Willaker crashed; that patch of undamaged wood which sheltered the most vicious of the German "Archies"; the little town where he brought down Müller, the German ace, after an epic fight which lasted twenty minutes.

Müller was not killed; he sometimes met that stout and smiling German, and they forgathered in a low Brussels estaminet and drank confusion to all soldiers who walked on their feet. Müller pilots a bus which plies daily between Amsterdam and Cologne, taking in Brussels en route.

GILES drew so many pounds per month for his services. He often wondered whether Mr. Josiah Conway had planted that infernal advertisement in his path out of sheer malice and spite. Certainly it was not to convince this skeptical air pilot of the value of Con-Lacto. Giles was beyond conviction. He had expressed his views with such force that he had expected to be forbidden the house.

"And you're really marvelously lucky that you're not," said Leslie Conway reproachfully. "Why on earth didn't you keep off the subject of Con-Lacto, darling? It is fearfully difficult for me as

it is. Daddy sent for an Almanach de Gotha last week, and he's been hunting up Filitera's pedigree."

Giles snorted. But this fair-haired and pretty daughter of Josiah Conway was used to snorts. Her father was one of the most effective snorters in the canned-food business.

"If he's in the Gotha—I'm a Dutchman!"

"He is in the Gotha," she said sternly. "He's the Count of Filitera and the Marquis Walmer-Rotalio."

"What's the idea? Is he to be the Duke de Con-Lacto?" asked Giles savagely.

"Daddy's very partial to him," said Leslie, with something of the family complacency. "He speaks well of Con-Lacto, anyway, and he is translating some of our labels into Italian."

Giles laughed sardonically.

And yet the matter was a very serious one for him. The fact that Leslie Conway was the only daughter of an extremely rich man scarcely counted.

HE DID not seriously blame Mr. Conway for thrusting down the throats of helpless invalids and innocent infants a slimy, shivery, creamy fluid that contained the concentrated values of the best cream plus the stimulating qualities of the finest cane sugar, plus Vitamin A, B or C. And Con-Lacto was the daily food of thousands—hundreds of thousands. It stood by many an invalid's bedside and reconciled him to his dissolution; it appeared in babies' bottles; it had been recommended by doctors, and formed the staple diet of infantile royalties. And because of this Mr. Josiah Conway had a castle on one of the upper reaches of the Thames, a great red-brick place that stood on a high hill and overshadowed a bend of the river. It gave him the right of warning trespassers that they would be shot at sight; it filled his massive marble garage with cars of a delicate breed, and enabled him to fish in Scottish rivers and shoot on Yorkshire moors and sleep beneath the roof of a flat in Carlton House Terrace.

"I merely stated—" began Giles.

"Giles, my darling, you talk too much. I suppose you really talk all the time you're flying, but the noise of the engine is so loud that you're hardly aware of the fact. What harm would it have done you to have told Daddy that Con-Lacto once saved your life? Instead of which you said that the only time you'd ever used it was to drop a tin on to the head of a German staff officer, and as if

that wasn't enough, you told him that immediately everybody in the neighborhood put on their gas masks!"

"I cannot lie—" began the virtuous Giles.

"You lied on one side, why not lie on another? Giles, dear, I'm terribly afraid that unless something can be done, I shall wake up one morning and see my picture in an illustrated weekly—'The beautiful Miss Leslie Conway, who is to marry the Count of Filitera.'"

Giles sighed.

"The next time I come to dinner I'll try to make amends," he said.

"If there is a next time," she warned him.

There was a next time, as it happened. Mr. Conway might despise the views of Giles Broad on the nutritive values of Con-Lacto, but he had a high respect for him as a pilot, and since business took him abroad every month, it was, he argued, very desirable that he should travel with the greatest assurance and safety.

"BUT you quite understand, Leslie, my dear, that there is to be no nonsense with this fellow? Naturally, I do not wish wholly to determine your future to meet my own views of what is right and best for you. There must be a certain independence of selection. Just as in our business we choose only the milk—"

"Daddy, let us keep to our subject," she interrupted gently. "Whatever Giles is, he isn't a cow."

Mr. Conway agreed. He wanted to see her happy and settled. But, then, he had wanted to see her happy and set-

tled on every occasion that an eligible young man (from his point of view) had loomed on the horizon. And always, it seemed to Leslie—happily for his peace of mind, Giles did not know this—there was an extraordinarily good reason why her own selective qualities should be brought into play.

"He is foolish," said Mr. Conway, "and a little uncouth. Such a business as ours could not have been built up except on a scientific basis. Eliminate science from Con-Lacto, and what have we? Nil, nothing! When this young man sneers at Con-Lacto he sneers at science. At—er—Faraday and Lister and Newton. . . . Such a man must have an unbalanced mind; such a man is no fit mate for my daughter." *Et cetera, et cetera.*

Leslie never really worried about her father's plain statements of the fact. The

